AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A method for initiating and sustaining a combustive reaction in a solid fuel, said method comprising:

generating at least one pulsed optical signal;

directing the pulsed optical signal to a plurality of ignition points within a single combustion chamber containing a solid fuel;

modulating the pulsed optical signal to initially have a first peak power sufficient to initiate a combustive reaction in [[a]] the solid fuel; and

modulating the pulsed optical signal to subsequently have a second peak power sufficient to sustain the combustive reaction once the combustive reaction is initiated.

2. (original) The method of Claim 1, wherein directing the pulsed optical signal comprises utilizing an optical fiber coupler including a plurality of optical fibers to transmit the pulsed optical signal to the plurality of ignition points.

3. (original) The method of Claim 1, wherein generating at least one pulsed optical signal comprises generating a plurality of pulsed optical signals.

4. (previously amended) The method of Claim 3, wherein directing the pulsed optical signal comprises directing each of the pulsed optical signals to at least one of the plurality of ignition points.

5. (original) The method of Claim 1, wherein generating at least one pulsed optical signal comprises generating the pulsed optical signal to have a wavelength sufficiently short so that absorption of the pulsed optical signal by the solid fuel leads to molecular disassociation of the solid fuel.

6. (original) The method of Claim 1, wherein generating at least one pulsed optical signal comprises generating the pulsed optical signal to have a duration

sufficiently short so that the signal will have sufficient energy to generate the combustive reaction of the solid fuel.

7. (currently amended) The method of Claim 1, wherein modulating the pulsed optical signal to initially have a first peak power comprises modulating the pulsed optical signal to have a first portion having a peak power sufficient to initiate [[a]] the combustive reaction in the solid fuel.

8. (original) The method of Claim 7, wherein modulating the pulsed optical signal to have a second peak power comprises modulating the pulsed optical signal to have a second portion having a peak power sufficient to sustain the combustive reaction until sufficient exothermic energy is released by the combustive reaction to make the reaction self-sustaining.

9. (currently amended) The method of Claim 1, wherein modulating the pulsed optical signal to initially have a first peak power comprises modulating a plurality of pulsed optical signals wherein a first pulsed optical signal has a peak power sufficient to initiate [[a]] the combustive reaction in the solid fuel.

10. (original) The method of Claim 9, wherein modulating the pulsed optical signal to have a second peak power comprises modulating at least one second pulsed optical signal generated subsequent to the first pulsed optical signal to have a peak power sufficient to sustain the combustive reaction until sufficient exothermic energy is released by the combustive reaction to make the reaction self-sustaining.

11. (original) The method of Claim 10, wherein generating at least one pulsed optical signal comprises generating the first pulsed optical signal a predetermined time prior to generating the second pulsed optical signal so that all the energy of the second pulsed optical signal will be uniformly absorbed by the solid fuel without causing undesirable optical processes to interfere with the initiation of the combustive reaction.

12. (currently amended) The method of Claim 1, wherein modulating the pulsed optical signal comprises modulating the pulsed optical signal in accordance with the equation:

$$I_{cr}=\{mcE_I(1+(\omega\tau)^2)]/[2\pi e^2\tau]\}[g+1/\tau_p \log_e(\rho_{cr}/\rho_0)]$$

where ρ_{cr} is the critical electron number for breakdown, τ_p is the ~~laser~~ optical signal pulse width; m, e, c are the electron constants; ω is the optical field frequency; E_I is the ionization energy of the solid fuel or an oxidizer; τ is the momentum transfer collision time; g is the electron loss rate; and ρ_0 is the initial electron density.

13. through 26. (cancelled)

27. (currently amended) A method for initiating and sustaining a combustive reaction of a solid fuel contained in a combustion chamber, said method comprising:

generating at least one pulsed optical signal;

directing the pulsed optical signal to a plurality of ignition points within a single combustion chamber containing the solid fuel;

initiating [[a]] the combustive reaction of the solid fuel utilizing the pulsed optical signal modulated to have a first peak power sufficient to initiate [[a]] the combustive reaction in [[a]] the solid fuel; and

sustaining the combustive reaction of the solid fuel utilizing the pulsed optical signal modulated to have a second peak power sufficient to sustain the combustive reaction until sufficient exothermic energy is released by the combustive reaction to make the reaction self-sustaining.

28. (original) The method of Claim 27, wherein directing the pulsed optical signal comprises utilizing an optical fiber coupler including a plurality of optical fibers to transmit the pulsed optical signal to the plurality of ignition points.

29. (original) The method of Claim 27, wherein generating at least one pulsed optical signal comprises generating a plurality of pulsed optical signals.

30. (previously presented) The method of Claim 29, wherein directing the pulsed optical signal comprises directing each of the pulsed optical signals to at least one of the plurality of ignition points.

31. (original) The method of Claim 27, wherein generating at least one pulsed optical signal comprises generating the pulsed optical signal to have a wavelength sufficiently short so that absorption of the pulsed optical signal by the solid fuel leads to molecular disassociation of the solid fuel.

32. (original) The method of Claim 27, wherein generating at least one pulsed optical signal comprises generating the pulsed optical signal to have a duration sufficiently short so that the signal will have sufficient energy to generate the combustive reaction of the solid fuel.

33. (currently amended) The method of Claim 27, wherein initiating a combustive reaction comprises modulating the pulsed optical signal to have a first portion having the first peak power sufficient to initiate **[[a]]** the combustive reaction in the solid fuel.

34. (original) The method of Claim 33, wherein sustaining the combustive reaction comprises modulating the pulsed optical signal to have a second portion having the second peak power sufficient to sustain the combustive reaction until sufficient exothermic energy is released by the combustive reaction to make the reaction self-sustaining.

35 (currently amended) The method of Claim 27, wherein initiating a combustive reaction comprises modulating a plurality of pulsed optical signals wherein a first pulsed optical signal has the first peak power sufficient to initiate **[[a]]** the combustive reaction in the solid fuel.

36. (original) The method of Claim 35, wherein sustaining the combustive reaction comprises modulating at least one second pulsed optical signal generated subsequent to the first pulsed optical signal to have a peak power sufficient to sustain the combustive reaction until sufficient exothermic energy is released by the combustive reaction to make the reaction self-sustaining.

37. (original) The method of Claim 36, wherein the method further comprises generating the first pulsed optical signal a predetermined time prior to generating the second pulsed optical signal so that all the energy of the second pulsed optical signal will be uniformly absorbed by the solid fuel without causing undesirable optical processes to interfere with the initiation of the combustive reaction.

38. (previously presented) The method of Claim 27, wherein initiating and sustaining the combustive reaction comprises modulating the pulsed optical signal in accordance with the equation:

$$I_{cr}=\{mcE_I(1+(\omega\tau)^2)]/[2\pi e^2\tau]\}[g+1/\tau_p \log_e(\rho_{cr}/\rho_0)]$$

where ρ_{cr} is the critical electron number for breakdown, τ_ρ is the optical signal pulse width; m, e, c are the electron constants; ω is the optical field frequency; E_I is the ionization energy of the solid fuel or an oxidizer; τ is the momentum transfer collision time; g is the electron loss rate; and ρ_0 is the initial electron density.